

NAS NORTH ISLAND - NAVY REGION SOUTHWEST NAVY ENVIRONMENTAL LEADERSHIP PROGRAM

CLEANUP

EVALUATE REMEDIATION BY NATURAL ATTENUATION FOR GROUNDWATER AT SITE 5

LEAD ACTIVITY

Southwest Division Naval Facilities Engineering Command (SWDIV)

STATUS

Complete

MISSION

Evaluate natural attenuation of groundwater contaminants

REQUIREMENT

Groundwater contamination may be reduced by natural processes. To determine whether those natural processes are occurring at sufficient rates to achieve cleanup levels within a reasonable time period, a monitoring system is required to track the level of contamination over time.

DESCRIPTION

Parsons Engineering Science, Inc., under contract to Naval Facilities Engineering Service Center (NFESC), implemented a program to collect and evaluate data to determine whether natural attenuation of groundwater contaminants is occurring at rates sufficient to protect human health and the environment. The program was conducted at a former solid waste disposal facility (Site 5/Unit 2) at Naval Air Station (NAS) North Island in San Diego, California. The area under study consists of a 300-foot-wide by 500-foot-long groundwater plume. Two golf course ponds bound the northern extent of the plume to the north and northeast while the southern end of the plume lies below a heavily irrigated golf course green.

Activities at the site resulted in contamination of shallow soils and groundwater. Groundwater contaminants include tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), trans-1,2-dichloroethene, vinyl chloride, ethene, and benzene, toluene, ethylbenzene, and xylenes (BTEX). The biological degradation of the chlorinated compounds via reductive dechlorination (natural attenuation) is being evaluated qualitatively. Results from four quarters of sampling show decreased concentrations of PCE and TCE and increased concentrations of cis-1,2-DCE and vinyl chloride near the source area. This is a strong indication that natural attenuation of chlorinated solvents, by reductive dechlorination, is occurring at Site 5/Unit 2.

BENEFITS

- Accurate evaluation and documentation of natural attenuation can demonstrate this technique's viability
- Contaminants are ultimately transformed to innocuous byproducts, not transferred to another phase or location within the environment
- The process is less energy-intensive and generally more effective in reducing residual contamination than current pump-and-treat technologies
- The process is non-intrusive and allows continuing use of infrastructure during remediation
- The process may pose less risk to potential receptors than engineered remedial technologies
- Remediation by natural attenuation is less costly than conventional engineered technologies

ACCOMPLISHMENTS/CURRENT STATUS

Date	Activity
MAY 1997	Work plan submitted
AUG 1997	Eight monitoring wells installed
SEP 1997	Draft work plan reviewed by regulators
OCT 1997	Initial field data collected; Initial report submitted to the Navy
APR 1998	Two additional monitoring wells installed
JAN 1998	Begin collection of three additional rounds of groundwater data
SEP 1998	Draft evaluation report submitted to the Navy
DEC 1998	Submit final evaluation report to Navy
JUN 1999	Removal Action to remediate Site 5/Unit 2, followed by RNA

FUTURE PLAN OF ACTION & MILESTONES

Not Applicable

COLLABORATION/TECHNOLOGY TRANSFER

When appropriate, natural attenuation will be considered as a remedial alternative at other Navy sites.

BIBLIOGRAPHY

- Parsons Engineering Science, Inc. Draft Final Work Plan for Assessing Remediation by Natural Attenuation for Groundwater Contamination at Site 5 (Unit 2) Golf Course Disposal Area at NAS North Island, San Diego CA. June 1997.
- Parsons Engineering Science, Inc. Preliminary Evaluation of Monitored Natural Attenuation for Groundwater at Site 5 (Area of VOC Contamination) Golf Course Disposal Area, NAS North Island, San Diego, California. December 1997.

- Parsons Engineering Science, Inc. Draft Evaluation of Monitored Natural Attenuation for Groundwater at Site 5 (Area of VOC Contamination) Golf Course Disposal Area, NAS North Island, San Diego, California. September 1998.

RELATED GOVERNMENT INTERNET SITES

None available

RELATED NAVY GUIDEBOOK REQUIREMENT

- 08011 Toxicity Reduction Evaluation

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